SOUTHWEST FISHERIES SCIENCE CENTER
FIRST AND SECOND QUARTER REPORT - FY 2004
For the Period October 1 - March 31

Submitted by: Roger Hewitt, Division Director, Fisheries Resources Division

Title of accomplishment of milestone: The Advanced Survey Technologies program has developed a novel, non-lethal surveying technique combining the information obtained by multi-frequency echo sounders, multi-beam sonar, and a remotely operated vehicle to assess rockfish habitat and abundance.

Current status: Field work has been completed for the year and data analysis is ongoing.

Background information: Marine sportfishing in Southern California is a huge industry that must be monitored and managed if it, and the associated rockfish stocks, are to be maintained. The stocks of lingcod and six rockfish species, including four that are important to California anglers and commercial fishermen (bocaccio, canary rockfish, widow rockfish and cowcod), are estimated at or below 25% of their pristine levels, and have been declared over fished by the Pacific Fisheries Management Council (PFMC).
Purpose of Activity: To use a non-lethal surveying technique to estimate the biomass and habitat of selected rockfish species.

Description of accomplishment and significant results:
Eight cruise legs were conducted totaling approximately 30 days at sea. Rockfish and their habitats were mapped at ten different locations using multi-frequency echosounders, multi-beam sonar, and ROV. Rockfish at one of these sites, the Forty-three Fathom Spot (Fig. 1), were monitored for site fidelity, diel vertical migratory behavior, and temporal variations in biomass on inter-hourly, daily, weekly, and monthly scales. Also at this location, the frequency specific sound scatter from six different rockfish species were measured in-situ and as a function of water depth (Fig 2). These target strength data will ultimately be used to acoustically discriminate animal taxa, and to scale the total acoustic energy scattered from rockfish to estimate their biomass density.

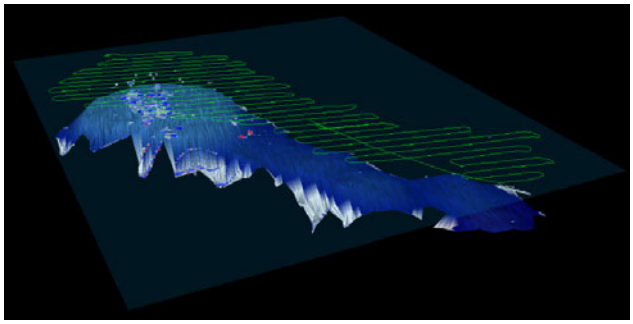

Figure 1. Acoustical survey of rockfish and bottom habitat at the 43-Fathom Spot track. 3-D bathymetric imaging, the cruise track, and fish schools are shown.

Significance of accomplishment: These instruments and their associated data analysis techniques have proven utility for estimating fish biomass, mapping bathymetry, and visually observing bottom terrain and fish species, respectively. Moreover, emerging

Figure 2. Multi-species rockfish school. (Photo captured by ROV).

analysis techniques using a combination of data from these instruments can yield more information such as fish behavior, temporal and spatial distributions, and habitat types.

Problems: Thirty days of ship time were supposed to have been completed in October and November, however, due to weather and problems scheduling support personnel, the ship time was not completed until early April.

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